

Darwin & Evolution Review

Grade: 12th
Subject: AP Biology
Date:

Mar 18-10:29 AM

Bellringer

→ What is the difference between allopatric and sympatric speciation?
 ← physical barrier → within population
 Provide an example of each.

→ What are the three main species concepts?
 Describe each concept.

Morphological, Biological, Evolutionary, Phylogenetic

→ What is convergent evolution? Explain this process and provide an example.



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1 Which one of these is mismatched?

- A Darwin-natural selection
- B Linnaeus-classified organisms according to the scala naturae
- C Cuvier- series of catastrophes explains the fossil record
- ☒ D Lamarck- uniformitarianism
- E all of these are correct

theory acquired characteristics

Lyell

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2 According to the theory of inheritance of acquired characteristics...

- A if a man loses his hand, then his children will also be missing a hand
- B changes in phenotype are passed on by way of the genotype to the next generation
- C organisms are able to bring about a change in their phenotype
- D evolution is striving toward improving particular traits
- ☒ E all of these are correct

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3 Why was it helpful for Darwin to learn that Lyell thought the earth was very old?

- A An old Earth has more fossils than a new Earth
- ☒ B It meant there was enough time for evolution to have occurred slowly
- C there was enough time for the same species to spread out into all continents
- D Darwin said that artificial selection occurs slowly
- E all of these are correct

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4 Organisms...

- A compete with other members of their species
- B differ in fitness
- C are adapted to their environment
- D are related by descent from common ancestors
- ☒ E all of these are correct

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5 DNA nucleotide similarities between organisms...

- A indicate the degree of relatedness among organisms
- B may reflect phenotypic (morphological) similarities
- C explain why there are phenotypic similarities
- D are to be expected if the organisms are related due to common ancestry
- ☒ E all of these are correct

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6 If evolution occurs, we would expect different biogeographical regions with similar environments to...

- A all contain the same mix of plants and animals
- ☒ B each have its own specific mixes of plants and animals
- ☒ C have plants and animals with similar adaptations
- D have plants and animals with different adaptations
- ☒ E both b and c

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7 It's possible to trace the evolutionary ancestry of a species

- A biogeographical evidence
- ☒ B fossil evidence
- ☒ C biochemical evidence
- ☒ D anatomical evidence
- ☒ E developmental evidence

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8 A group of related species have homologous structures

- A biogreographical
- ☒ B fossil
- C biochemical
- ☒ D anatomical
- ☒ E developmental

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9 The same types of molecules are found in all living things

- A biogeographical
- B fossil
- ☒ C biochemical
- D anatomical
- E developmental

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10 All vertebrate embryos have pharyngeal pouches

- A biogeographical
- B fossil
- C biochemical
- D anatomical
- E developmental

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11 Transitional fossils have been found between some major groups of organisms

A biogeographical

B fossil

C biochemical

D anatomical

~~E developmental~~

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12

If 98 out of 200 individuals in a population express the recessive phenotype, what percent of the population are homozygous dominant ?

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- 13 If 98 out of 200 individuals in a population express the recessive phenotype, what percent of the population are heterozygotes?

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- 14 Brown hair (B) is dominant to blond hair (b). If there are 168 brown hairs in a population of 200:

What is the predicted frequency of heterozygotes?

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15

Brown hair (B) is dominant to blond hair (b). If there are 168 brown hairs in a population of 200:

What is the predicted frequency of homozygous recessive?

$$\begin{aligned}
 p + q &= 1 \\
 p^2 + 2pq + q^2 &= 1 \\
 \sqrt{168} &= q^2 = \text{recessive} \\
 q &= .4 \\
 B &= p = .6
 \end{aligned}$$

Bb → brown

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16 If blonds occur in 36% of the population:

What is the allele frequency for b?

$$\begin{aligned}
 p + q &= 1 \\
 p^2 + 2pq + q^2 &= 1 \\
 \text{population} &= 200
 \end{aligned}$$

B = Brown
b = blond

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17 If blonds occur in 36% of the population:

What is the allele frequency for B?

⋮

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18 If blonds occur in 36% of the population:

What is the predicted frequency of heterozygotes?

$$\begin{aligned} p + q &= 1 \\ p^2 + 2pq + q^2 &= 1 \\ p &= .6 \\ q &= .4 \end{aligned} \quad \begin{aligned} 2(.6)(.4) &= .48 \rightarrow 48\% \\ &\text{heterozygotes} \end{aligned}$$

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19 If blonds occur in 36% of the population:

What is the predicted frequency of homozygous dominant?

$$p + q = 1$$

$$p^2 + 2pq + q^2 = 1$$

$$q = .4$$

$$p^2 = ?$$

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Bellringer

→ What are the 3 main species concepts?
Explain each concept.

→ What is abiogenesis? What experiment(s) supports this idea? Miller-Urey

→ What are the five "major" mass extinctions?
Permian → 4% K-T Iridium

* Long-term Review *

→ What are the two major parts of photosynthesis?

→ What limits cell size?

→ What are the parts of cellular respiration? Explain.

Mitosis → Somatic cells
Meiosis → sex

Surface area: volume ratio

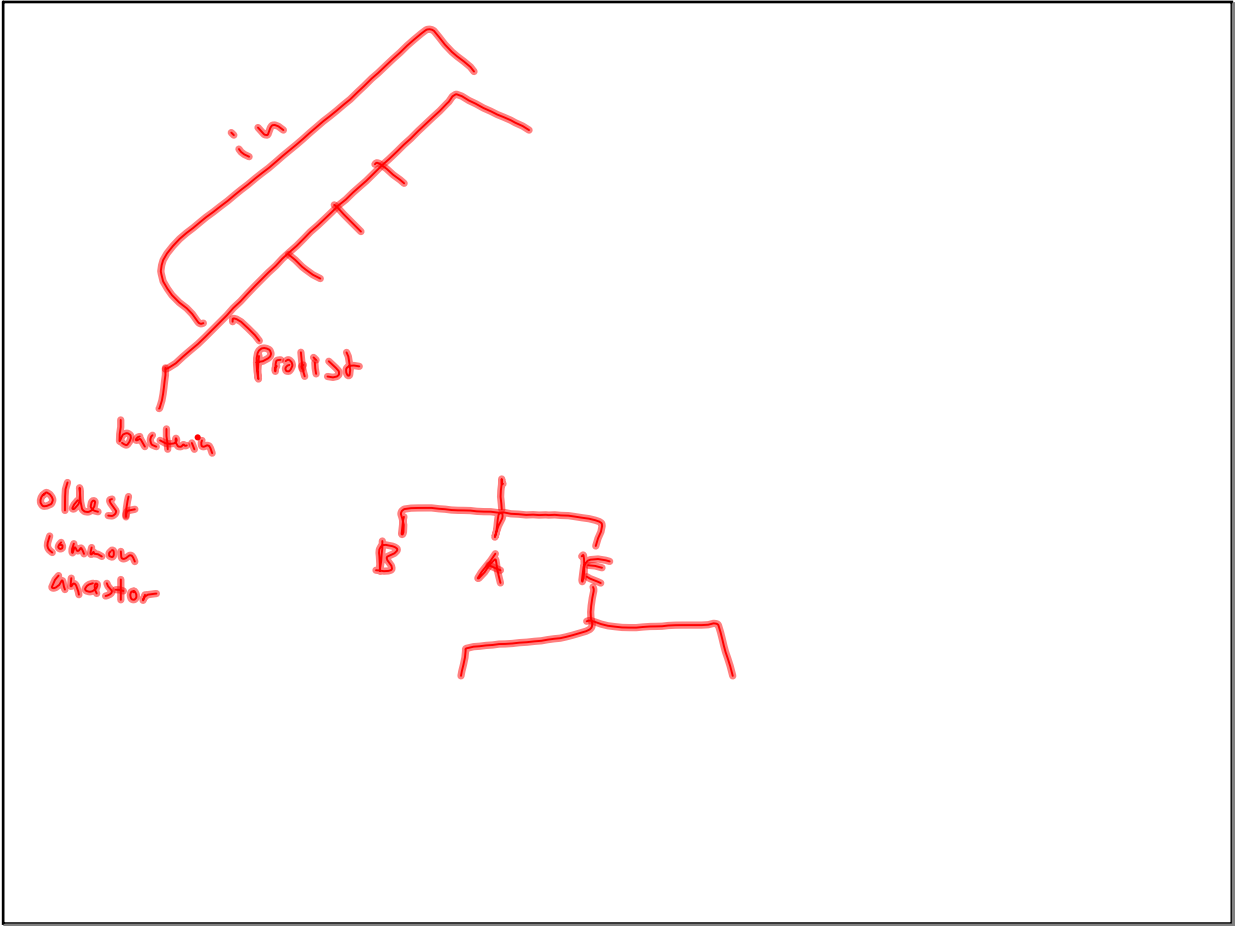
6 · 10³ · 10² → 6 · 10⁵ → 6 · 10⁵ · 10⁻² = 6 · 10³ = 6000

SA/V → # Efficiency

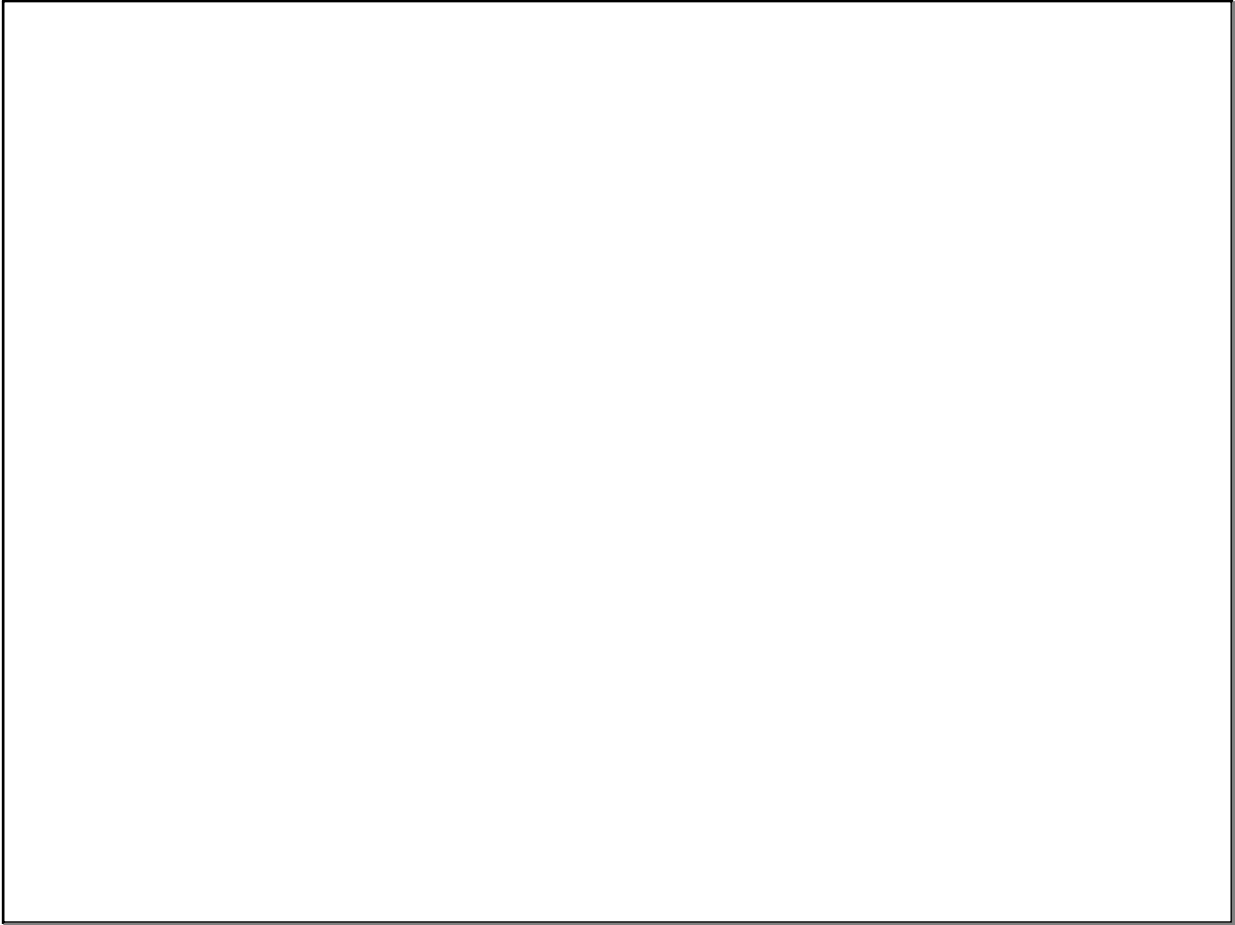
6 · 10³ · 10² / (10²)³ = 6 · 10³ · 10² / 10⁶ = 6 · 10³ · 10⁻⁴ = 6 · 10⁻¹ = 0.6

0.0024 / 8 · 10⁻⁶ = 300 : 6(2)(2) / 2³ = 3

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